

WHAT IS CLAIMED IS:

1. A vacuum processing apparatus for applying a designated process on an object to be processed in a vacuum atmosphere, comprising:

5 a processing vessel for applying the designated process on the object introduced thereinto; and

a vacuum pump arranged on either downside or upside the processing vessel so as to be coaxial with the processing vessel, for sucking exhaust gas in the processing vessel thereby to form a vacuum.

10 2. A vacuum processing apparatus as claimed in Claim 1, wherein the processing vessel is provided, therein, with a susceptor for mounting the object thereon, while the vacuum pump is arranged below the susceptor so as to be coaxial with the processing vessel.

15 3. A vacuum processing apparatus as claimed in Claim 2, wherein the vacuum pump is constructed cylindrically as the whole.

4. A vacuum processing apparatus for applying a designated process on an object to be processed in a vacuum atmosphere, comprising:

20 a processing vessel for applying the designated process on the object introduced thereinto, the processing vessel being provided, therein, with a susceptor for mounting the object thereon;

a vacuum pump constructed cylindrically as a whole and arranged below the susceptor in the processing vessel so as to be coaxial with the
25 processing vessel, for sucking exhaust gas in the processing vessel thereby to

form a vacuum; and

a driving mechanism arranged below the susceptor, for moving it up and down, wherein the vacuum pump is arranged around the driving mechanism coaxially therewith.

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5. A vacuum processing apparatus as claimed in Claim 4, wherein the vacuum pump is a turbo-molecular pump.

6. A vacuum processing apparatus for applying a designated process on an object to be processed in a vacuum atmosphere, comprising:

a processing vessel for applying the designated process on the object introduced therinto, the processing vessel being provided, therein, with a susceptor for mounting the object thereon;

a turbo-molecular vacuum pump constructed cylindrically as a whole and arranged below the susceptor in the processing vessel so as to be coaxial with the processing vessel, for sucking exhaust gas in the processing vessel thereby to form a vacuum,

the turbo-molecular vacuum pump including:

a cylindrical inner housing arranged in coaxial with the processing vessel;

a cylindrical motor stator arranged outside the cylindrical inner housing;

a number of rotors rotatably arranged with respect to the cylindrical motor stator;

a cylindrical outer housing arranged outside the rotors; and

a number of stators fixed to the cylindrical outer housing so as to each extend between the adjacent rotors; and

a driving mechanism arranged below the susceptor, for moving it up and down, wherein the vacuum pump is arranged around at least a portion of the driving mechanism coaxially therewith.

7. A vacuum processing apparatus as claimed in Claim 1, further comprising an exhaust port communicating with the vacuum pump and opening to the interior of the processing vessel, wherein the exhaust port is arranged in a floor of the processing vessel annularly and uniformly.

8. A vacuum processing apparatus as claimed in Claim 7, wherein the exhaust port is identical to an annular opening succeeding in the circumferential direction of the processing vessel.

9. A vacuum processing apparatus as claimed in Claim 7, wherein the exhaust port is constituted by a plurality of openings separated from each other in the circumferential direction of the processing vessel.

10. A vacuum processing apparatus as claimed in Claim 7, wherein the exhaust port is arranged around the susceptor for mounting the substrate thereon.